



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/026,477	12/27/2001	Hong Suk Yoo	8733.561.00	7762
30827	7590	01/16/2004	EXAMINER	
MCKENNA LONG & ALDRIDGE LLP			RUDE, TIMOTHY L	
1900 K STREET, NW			ART UNIT	
WASHINGTON, DC 20006			PAPER NUMBER	

2871

DATE MAILED: 01/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/026,477	Applicant(s) YOO ET AL.	
	Examiner Timothy L Rude	Art Unit 2871	<i>NW</i>

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 23 October 2003.
- 2a) ☐ This action is FINAL.      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-41 is/are pending in the application.
- 4a) Of the above claim(s) 6-13 and 27-41 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 14-26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

#### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)      4) ☒ Interview Summary (PTO-413) Paper No(s). 20040107.
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)      5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 20021107.      6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Election/Restrictions***

Applicant's election without traverse of Group I (claims 1-5 and 14-26) in Paper No. 20031023 is acknowledged. Also, during a subsequent telephone interview (summary included), election was completed to include Species IA (claims 2, 3, and 15-26, with claims 1, 4, 5, and 14 generic) without traverse.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 14 is rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling. The storage capacitor electrode critical or essential to the practice of the invention, but not included in the claim(s) is not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976). Specification paragraph [0029] starting on page 6 clearly cites a storage capacitor electrode as being critical or essential to the practice of the invention.

Claim 15 is rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling. A pixel electrode and a conductive layer critical or essential to the practice of the invention, but not included in the claim(s) is not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976).

Specification paragraph [0029] starting on page 6 clearly cites a pixel electrode and a conductive layer as being critical or essential to the practice of the invention.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, and 4 are rejected under 35 U.S.C. 102(b) as being anticipated by Dae-Gyu Moon (Moon) USPAT 6,133,967.

As to claim 1, Moon discloses in the 5<sup>th</sup> embodiment (col. 6, lines 8-63 and Figures 8A-8D) a liquid crystal display (LCD) device comprising:

- a first substrate defined by first and second regions;
- a storage capacitor electrode, 4, and a gate electrode, 3, respectively formed in the first and second regions of the first substrate;
- a gate insulating layer, 5 and 6, formed on an entire surface of the first substrate so that the first region (on the right of Figure 8D) is thinner than the second region (on the left of Figure 8D);
- a semiconductor layer, 1, and source, 8, and drain, 9, electrodes deposited on the gate insulating layer of the second region;

Art Unit: 2871

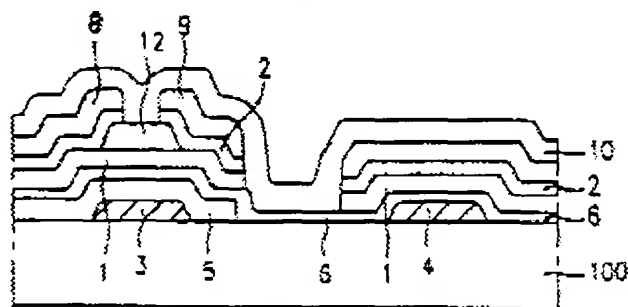
a conductive layer (unlabeled layer between layers 2 and 10 above 4) formed on the gate insulating layer of the first region;

a pixel electrode (not shown, inherent to comprise functional device) electrically connected to the drain electrode and the conductive layer;

a second substrate opposite to the first substrate (not shown, inherent); and

a liquid crystal layer formed between the first and second substrates (not shown, inherent).

FIG. 8D



As to claim 2, Moon discloses in Figure 8D the LCD device as claimed in claim 1, wherein the gate insulating layer of the first region is a single-layered film, 6, and the gate insulating layer of the second region is a double-layered film, 5 and 6.

As to claim 4, Moon discloses in Figure 8D the LCD device as claimed in claim 1, wherein the first region is a storage capacitor region, and the second region is a thin film transistor region (col. 6, lines 10-16).

Claim 14 is rejected under 35 U.S.C. 102(b) as being anticipated by Kim et al (Kim) provided by Applicant.

As to claim 14, Kim discloses in a number of drawings a liquid crystal display (LCD) device comprising:

- a gate line, G, and a data line arranged to cross each other and to define a pixel region;
- a thin film transistor formed on a crossing region of the gate line and the data line;
- a pixel electrode, 4, formed in the pixel region; and
- a storage capacitor formed by an overlap between the pixel electrode and a gate line adjacent to the pixel electrode. Please note that item 10c is a neighboring gate line in at least some embodiments of Kim.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3, 15-22, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moon.

As to claim 15, Moon teaches in Figure 8D a liquid crystal display (LCD) device comprising:

- a first substrate; a second substrate;
- a liquid crystal layer formed between the first and second substrates;
- a storage capacitor, (combination of 4, 6, 1, 2, and unlabeled 9; col. 6, lines 10-30), formed in a first region of the first substrate;
- a thin film transistor formed in a second region of the first substrate.
- a gate electrode, 3, for the thin film transistor and a storage capacitor electrode, 4, spaced apart from the gate electrode, both formed on the first substrate;
- a first insulating layer, 5, formed on the surface of the first substrate except an upper portion of the storage capacitor electrode;
- a second insulating layer, 6, formed on the first insulating layer and the storage capacitor electrode.

Moon does not explicitly disclose a first insulating layer, 5, formed on an entire surface of the first substrate except an upper portion of the storage capacitor electrode. However, the teachings of Moon are considered to render the claimed invention obvious to those having ordinary skill in the art of liquid crystals, since there is almost no functional significance to the minor structural difference as claimed.

In considering the disclosure of a reference it is proper to take into account not only specific teachings of the reference but also the inferences which one skilled in the art would reasonably be expected to draw therefrom (MPEP 2144.01).

Moon is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to remove the first insulating layer from the capacitor electrode to facilitate formation of a capacitor with increased capacity and thereby allow the improvement of aperture ratio.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Moon with the removal of the first insulating layer from the capacitor electrode to facilitate formation of a capacitor with increased capacity and thereby allow the improvement of aperture ratio.

As to claims 3 and 16, Moon discloses the device above.

Moon does not explicitly disclose a device wherein the gate insulating layer of the first region, 6 (Applicant's second insulating layer), has a thickness in a range of about 100Å~4000Å.

Moon teaches the purpose of removing the first insulating layer (Applicant's thinner insulating layer in the first region) is to increase the value of capacitance to allow increased viewing angle (Title and col. 6, lines 30-40) which constitutes a results effective variable.

Moon is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to reduce the gate insulating layer thickness of the



first region to a thickness in a range of about 100Å~4000Å to increase the value of capacitance to allow increased viewing angle.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Moon with the reduced gate insulating layer thickness of the first region to a range of about 100Å~4000Å to increase the value of capacitance to allow increased viewing angle.

As to claim 17, Moon discloses in Figure 8D the liquid crystal display device as claimed in claim 15, further comprising a semiconductor layer, 1, formed above the second insulating layer in the second region and used as a channel of the thin film transistor.

As to claim 18, Moon discloses in Figure 8D the liquid crystal display device as claimed in claim 15, further comprising a source electrode, 8, and a drain electrode, 9, opposing each other and formed above the semiconductor layer.

As to claim 19, Moon discloses in Figure 8D the liquid crystal display device as claimed in claim 15, further comprising a conductive layer (unlabeled 9 between 2 and 10) of the same material as the source and drain electrodes and formed on the second insulating layer in the first region.

As to claim 20, Moon discloses in Figure 8D the liquid crystal display device as claimed in claim 15, further comprising an ohmic contact layer, 2, formed at an interface between the source and drain electrodes and the semiconductor layer.

As to claim 21, Moon discloses in Figure 8D the liquid crystal display device as claimed in claim 15, further comprising a passivation layer, 10, having a contact hole and formed on an entire surface including the conductive layer and the source and drain electrodes to expose upper portions of the drain electrode and the conductive layer.

As to claim 22, Moon discloses in Figure 8D the liquid crystal display device as claimed in claim 21, further comprising a pixel electrode electrically connected to the drain electrode and the conductive layer through the contact hole (inherent to a functional device and obvious to those having ordinary skill in the art given the other embodiments of Moon).

As to claim 26, Moon discloses in Figure 8D the liquid crystal display device of claim 15, wherein the first insulating layer, 5, and the second insulating layer, 6, are deposited on the second region where the thin film transistor is formed, and only the second insulating layer, 6, is formed on the first region where the storage capacitor is formed.

Art Unit: 2871

Claims 5 and 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moon, as applied to claims above, in view of Hwang USPAT 6,545,730 B1.

As to claims 5 and 23-25, Moon discloses the LCD device as claimed in claims 1 and 15.

Moon does not explicitly disclose a device wherein the second substrate further includes: a plurality of Red (R), green (G), and blue (B) color filter patterns formed on the second substrate opposite to the first substrate for displaying colors; a black matrix for dividing the respective color filter patterns and for shielding light; and a common electrode for applying a voltage to the liquid crystal layer, however this is well known in the art.

For example, Hwang teaches in the background of the invention, and in the first preferred embodiment, a second substrate, 200, comprising a plurality of Red (R), green (G), and blue (B) color filter patterns (col. 1, lines 26-33 and col. 2, lines 22-28; and Figure 2) for displaying colors; a black matrix, 210, for dividing the respective color filter patterns and for shielding light; and a common electrode, 220, for applying a voltage to the liquid crystal layer formed on the entire surface (col. 3, lines 24-26) including the black matrix and the color filter patterns, to achieve good color display performance with good contrast and good aperture ratio.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Moon with the second substrate comprising a plurality of Red (R), green (G), and blue (B) color filter patterns for displaying colors; a black matrix for dividing the respective color filter patterns and for shielding light; and a common electrode for applying a voltage to the liquid crystal layer formed on the entire surface including the black matrix and the color

Art Unit: 2871

filter patterns of Hwang to achieve good color display performance with good contrast and good aperture ratio.

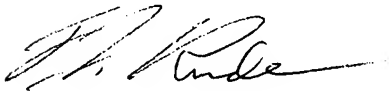
References cited but not applied are relevant to the instant Application.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy L Rude whose telephone number is (703) 305-0418. The examiner can normally be reached on Monday through Thursday.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H Kim can be reached on (703) 305-3492. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4900.



TLR

Timothy L Rude  
Examiner  
Art Unit 2871



ROBERT H. KIM  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800